



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,319	02/12/2004	Jae-Young Jung	46295	4096
1609	7590	04/08/2005	EXAMINER	
ROYLANCE, ABRAMS, BERDO & GOODMAN, L.L.P. 1300 19TH STREET, N.W. SUITE 600 WASHINGTON, DC 20036			MULL, FRED H	
			ART UNIT	PAPER NUMBER
			3662	

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/776,319	JUNG ET AL.	
	Examiner Fred H. Mull	Art Unit 3662	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 18 January 2005.
- 2a) This action is **FINAL**.                                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-16 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 February 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	6) <input type="checkbox"/> Other: _____

## **DETAILED ACTION**

### ***Observations***

1. For simplicity, all citations to the specification will refer to the paragraph number used in the application's Patent Application Publication, US 2004/0160360 A1.

### ***Response to Arguments***

2. Applicant's arguments on p. 8, with regard to various objection(s), have been fully considered but they are not persuasive.

In the previous Office Action, the examiner pointed out an inconsistency between ¶ 19 and ¶ 20 of the application. Applicant cites Parkinson and Kaplan and alleges there is no problem with ¶ 19-20. However, these references actually support the examiner's position. In Kaplan, equations 17-19 correspond to applicant's equation 1. However, Kaplan's equations 15-16 show that  $x_p$  and  $y_p$  are positions, not velocities, as is claimed in applicant's ¶ 20. Similarly, the final equation in Table 8 of Parkinson corresponds to applicant's equation 1, but the set of equations three lines up shows that what applicant refers to as  $x_p$  and  $y_p$  are positions, not velocities. Thus, ¶ 20 is in error.

3. Applicant's arguments on p. 8-9 and 12-13, with respect to the rejection(s) of claims 1-16 over 35 USC 112 1<sup>st</sup> have been fully considered but they are not persuasive.

While applicant states: "the term pseudo velocity is clearly described in the specification" (p. 9, lines 5-6), applicant does not point out where in the specification the definitive definition of pseudo velocity is to be found.

If the examiner understands applicant's argument, it is that:

- 1) The MS is assumed close enough to the BS to use the BS position as the MS position (¶ 73).
- 2) The pseudo velocity is calculated based on the range from the satellite to the BS/reference receiver, and hence the approximate range to the MS in view of (1).
- 3) Therefore, the pseudo velocity takes into account the velocity of the MS (p. 13, 2<sup>nd</sup> ¶, last sentence), and the definition in ¶ 40, lines 19-24, that pseudo velocity is the relative velocity between the satellite and the mobile station (MS), is correct.

However, (3) does not follow from (1) and (2). The relative position between the MS and BS says nothing about the relative velocity of the MS and BS. The BS could be at rest and the MS at rest, or the BS could be at rest and the MS speeding by at 65 mph in a highway vehicle, or even greater speeds aboard a train or boat or airplane. The mathematical definition in equation 20(a) conflicts with the descriptive definition ¶ 40, lines 19-24. The velocity of the MS is not taken into account in eq. 20(a).

The term "pseudo velocity" must be explicitly defined in the specification. If, in order to remove the cited inconsistency, applicant assumes the velocity of the MS to be the velocity of the BS, this should be explicitly included in the definition of "pseudo velocity" or included in the claims.

4. Applicant's arguments on p.13-27, with respect to the rejection(s) of claim(s) 1-16 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

***Information Disclosure Statement***

5. For future reference, any references cited by the applicant should be cited in an Information Disclosure Statement. In this case, the examiner has cited the provided references.

***Specification***

6. The disclosure is objected to because of the following informalities:

In ¶ 20, in each of lines 6, 7, and 8, "velocity" should be deleted and --in the reference frame of the orbital plane-- should be added after "satellite".

In ¶ 20, in line 2, before "X-axis", --Earth-Centered, Earth-Fixed (ECEF)-- should be added.

In ¶ 20, in line 4, before "Y-axis", --ECEF-- should be added.

In ¶ 20, in line 5, before "Z-axis", --ECEF-- should be added.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The term "pseudo velocity" is not clearly defined. In ¶ 40, lines 19-24 it appears to be defined as the relative velocity between the satellite and the mobile station (MS). However, in ¶ 92, eq. 20(a) (and related eq. 19), it appears that the velocity of MS is not taken into account, and that the "pseudo velocity" is the velocity of the satellite in ECEF coordinates, where certain time delays are determined based on the position of the MS. In ¶ 96, the propagation delays appear to be a key feature of the "pseudo velocity". However, from eq. 20(a) and ¶ 78 and 93, the propagation delay term, Error|Tc, is described generally as "caused by a variety of factors" and it is not shown how these are determined. Indeed, ¶ 93 then goes on to eliminate Error|Tc from the equation (lines 9-11). One of ordinary skill in the art would need to know how to determine Error|Tc, and eliminating the term would appear to reduce the invention to the case described in the Background section, admitted as being prior art. In order to make and/or use the invention, one of ordinary skill in the art would require a clear definition of the term "pseudo velocity".

The examiner would also like to suggest adding a table which summarizes what all of the myriad variables (e.g.  $PR_{sv\_gpssrv}$ ) stand for in order to help navigate the equations in the disclosure.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 4-5 and claim 9, line 4 each recite determining pseudo ranges, however, it is not specified what the pseudo ranges are being measured relative to. Is it the pseudo ranges between the satellites and the MS, or the pseudo ranges between the satellites and the BS? From ¶ 38, 40, and 73, the pseudo ranges appear to be measured between the satellites and the BS, which is assumed to be the approximate position of the MS.

Claim 1, line 6 and claim 9, line 6, each recite determining satellite velocity, however, it is not specified what the satellite velocities are being measured relative to. Is it the satellite velocities relative to the MS, the BS, or the ECEF coordinate system?

#### ***Allowable Subject Matter***

9. Claim(s) 1-16 would be allowable if amended to overcome the rejection(s) under 35 U.S.C. 112, set forth in this Office action, without the addition of new matter.

The following is an examiner's statement of reasons for allowance:

Camp discloses approximating the position of the MS as the position of the BS (col. 4, lines 27-28) and providing the MS code phase and Doppler shift (col. 4, line 51 to col. 5, line 10).

Whitehead discloses taking propagation delay into account when performing GPS positioning (col. 8, lines 16-26; col. 12, line 11 to col. 14, line 6).

Zhao discloses providing the MS code phase and Doppler shift and taking propagation delay into account when performing GPS positioning (col. 4, lines 63-67).

van Diggelen '892, which discloses a satellite data collector for collecting satellite orbital information and pseudo range of more than three consecutive times from a plurality of satellites (col. 6, lines 33-41).

Diggelen '114 discloses approximating the position of the MS as the position of the BS and providing the MS code phase and Doppler shift (¶ 34).

Fuchs, which discloses a satellite data collector for collecting satellite orbital information and pseudo range of more than three consecutive times from a plurality of satellites (col. 4, lines 2-3; col. 7, lines 20-28) and taking propagation delay into account when performing GPS positioning (col. 7, lines 10-19).

Cahn (col. 3, lines 26-29) and Young (col. 10, lines 37-39), which discloses averaging pseudo ranges in order to increase accuracy.

However, there is no reason to combine any set of these references to in such a way as to make obvious applicant's invention. For example, if either of Cahn and Young were to be combined with a reference that approximated the MS location as the

BS location, the inaccuracy of that approximation would outweigh any increase in accuracy by the averaging.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred H. Mull whose telephone number is 703-305-1250. The examiner can normally be reached on M-F 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H. Tarcza can be reached on 703-360-4171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Effective April 5, 2005, the following new telephone numbers will be in effect:  
Fred H. Mull: 571-272-6975, Thomas H. Tarcza: 571-272-6979.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred H. Mull  
Examiner  
Art Unit 3662

fhm

  
THOMAS H. TARCZA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600